

REMARKS

Claims 1–8 and 10-19 are pending in this application. Claims 1, 2, 13 and 14 have been amended herein. Applicants submit that no new matter has been added. Applicants respectfully request reconsideration of the Application in view of the foregoing amendments and the following remarks.

I. Rejections Under 35 U.S.C. §102:

Claims 1-4 and 12-15 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,321,019 to Degawa *et al.* (hereafter “Degawa”).

Independent claim 1, has been amended as set forth above. Support for the amendatory language can be found at least in original claim 4, the second paragraph of page 9, the first paragraph of page 10 and FIG. 1. Amended claim 1 now recites:

“A compressor with a lubrication structure, comprising:
a rotary shaft;
a piston;
a suction pressure zone, the internal pressure of which is suction pressure;
a driving body accommodating chamber;
a driving body accommodated in the driving body accommodating chamber, wherein the driving body converts rotation of the rotary shaft into reciprocation of the piston, thereby causing the piston to compress gas;
a gas passage that extends through the rotary shaft and communicates with the driving body accommodating chamber so that gas in the driving body accommodating chamber flows into the gas passage, wherein the gas passage includes an expansion portion formed in the rotary shaft along the axis of the rotary shaft, and wherein the expansion portion connects to the suction pressure zone so that the gas in the expansion portion flows into the suction pressure zone; and
a fluid passage formed in the rotary shaft opening at one end to the expansion portion and at the other end to the driving body accommodation chamber,
wherein the maximum cross-sectional area of the expansion portion is greater than the maximum cross-sectional area of a section of the gas passage that is upstream of the expansion portion with regard to gas flow in the gas passage.”

In accordance with an exemplary embodiment of the present invention, as illustrated by FIG. 1, the gas passage (361, 36, 37) extends through the rotary shaft (18) and communicates with the driving body accommodating chamber (121) so that gas in the driving body accommodating chamber flows into the gas passage, and that the expansion portion (37) connects to the suction pressure zone (30, 131) so that gas in the expansion portion flows into the suction pressure zone. In particular, the gas in the driving body accommodating chamber (121) flows out to the suction pressure zone (30, 131) via the gas passage (361, 36, 37). When the gas flows through the gas passage, the gas receives the centrifugal action, which is caused by the rotation of the rotary shaft (18), in the expansion portion (37). The oil contained in the gas is separated from the gas by the centrifugal action in the expansion portion. The oil separated from the gas flows into the driving body accommodating chamber from the expansion portion through the fluid passage (38) to lubricate portions in the driving body accommodating chamber, which need lubrication. The gas, which has been separated from the oil, flows into the suction pressure zone from the expansion portion.

Degawa discloses a swash plate type compressor, wherein “[a]t the central part of the shaft 20, a hole 98 is formed one end of which is open to the residual oil accumulating chamber 86 and the other end of which connects with apertures 100 and 102 respectively being open to thrust bearings 32 and 34.” [See C3, L31-35]. In particular, Degawa discloses that the oil is separated from the refrigerant gas in the *separation chambers 54, 56 arranged outside the rotary shaft 20* and is supplied to the bearing 28. The refrigerant gas separated from the oil flows from the separation chamber 56 into the passage 98 formed in the rotary shaft 20 and flows into the swash plate chamber 42 through passages 100, 102. [See C3, L51 through C4, L28]. Accordingly, if the refrigerant gas containing the oil flows from the separation chamber 56 into passage 98, the refrigerant gas flows into the swash plate chamber 42 without being separated from the oil.

In the Office Action, the Examiner contends that “a gas passage (shown by 44, 92, 94, 100 and 102 etc. in figure 1) that extends through the rotary shaft and communicates with the driving body accommodating chamber flows into the gas passage, wherein the gas passage includes an expansion portion (in space around 42 of figure 1); and a fluid passage formed in the rotary shaft to open to the expansion portion and the driving body accommodation chamber (32,

43 figure 1).” [See Office Action, page 2, lines 18-24]. In addition, the Examiner asserts that “the cross-sectional of the expansion portion gradually increases from the upstream and towards the downstream end (see where the two cross-sections meet in figure 1, there is not an abrupt increase rather there is a gradual increase).” [See Office Action, page 3, lines 6-10].

Applicants respectfully disagree with the Examiner’s characterization of the Degawa reference. As best understood from the Office Action, it appears that the Examiner has misconstrued the “space around 42 of figure 1” of Degawa to be equivalent to the claimed “expansion portion.” In view of this mischaracterization, Applicants have further clarified the “expansion portion” feature by reciting “the gas passage includes **an expansion portion formed in the rotary shaft along the axis of the rotary shaft**,” as now recited in amended claim 1.

In view of the above, Applicants respectfully assert that Degawa fails to disclose a gas passage that extends through the rotary shaft and communicates with the driving body accommodating chamber so that gas in the driving body accommodating chamber flows into the gas passage. Degawa also fails to disclose or suggest that the gas passage includes an expansion portion that is formed in the rotary shaft along the axis of the rotary shaft and connects to the suction pressure zone so that the gas in the expansion portion flows into the suction pressure zone.

In Addition, it appears as though the Examiner has misconstrued an apparent difference in diameter of shaft 20 (i.e. labels “A” and “B” shown in the “Section of figure 1 from Degawa et al.” in Office Action, page 3) to be equivalent to the claimed “cross-sectional area of the expansion portion” and gas passage features. Applicants respectfully note that Degawa merely discloses that “[a]t the central part of the shaft 20, a hole 98 is formed one end of which is open to the residual oil accumulating chamber 86 and the other end of which connects with apertures 100 and 102”. [See C3, L31-35]. Degawa is silent about the cross-sectional area of “hole 98”. The difference in diameter of shaft 20 (i.e. labels “A” and “B”), noted by the Examiner in page 3 of the Office Action, cannot be construed as the claimed “cross-sectional area of the expansion portion” and gas passage features. In an exemplary embodiment of the instant invention, as illustrated by FIG. 1, “[t]he maximum cross-sectional area of the expansion passage 37, i.e., the cross-sectional area of the circumferential portion 372, is larger than the

cross-sectional area of the guide passage 36 located upstream of the expansion passage 37 with regard to the flow of the refrigerant gas.” [See page 10 of the specification, as originally filed].

Moreover, the Examiner first contends that “the gas passage includes an expansion portion (in space around 42 of figure 1)”, and later asserts that “the expansion portion has an upstream end (end of section corresponding to A) and a downstream end (end of section corresponding to B)”. Neither comparison is correct. It is unclear to Applicants how an “expansion portion (in space around 42 of figure 1)” can also be located “where the two cross-sections meet in figure 1” of Degawa, as stated in page 3 of the Office Action.

In view of the above, Applicants respectfully assert that Degawa does not teach or disclose at least the features of amended claim 1. Independent claim 13 includes at least similar features as those found in claim 1. Accordingly, Applicants respectfully submit that claims 1 and 13, and claims depending thereon, are patentably distinguishable over Degawa. As a result, the rejections based on Degawa should now be withdrawn.

II. Rejections Under 35 U.S.C. §103:

Claims 5-8, 10, 11 and 16-19 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Degawa in view of U.S. Patent No. 6,675,607 to Tarutani *et al.* (hereafter “Tarutani”) and further in view of U.S. Patent No. 5,419,685 to Fujii *et al.* (hereafter “Fujii”).

None of Tarutani or Fujii cures the above-discussed deficiencies of Degawa. As a result, none of the cited references, taken alone or in combination, teach or suggest all of the features of claims 5-8, 10, 11 and 16-19. Accordingly, Applicants submit that all of the pending claims are now in condition for allowance.

Applicants do not believe it necessary at this time to further address the rejections of dependent claims as Applicants believe that the forgoing amendments and remarks patentably distinguish all of the pending claims over the cited references. Applicants, however, reserve the right to address those rejections in the future should such a response be deemed necessary and appropriate.

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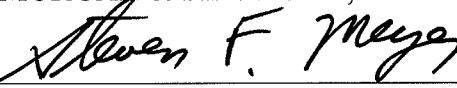
Based on the foregoing amendments and remarks, Applicants respectfully request reconsideration and withdrawal of the rejection of claims and a prompt allowance of this application.

AUTHORIZATION

The Commissioner is hereby authorized to charge any additional fees which may be required for consideration of this Amendment to Deposit Account No. **13-4500**, Order No. 5000-5142. A DUPLICATE OF THIS DOCUMENT IS ATTACHED.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. **13-4500**, Order No. 5000-5142. A DUPLICATE OF THIS DOCUMENT IS ATTACHED.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

By: 
Steven F. Meyer
Registration No. 35,613

Correspondence Address:

Address Associated With Customer Number:

27123

(212) 415-8700 Telephone
(212) 415-8701 Facsimile